

REMARKS:

This application has been carefully studied and amended in view of the Office Action dated December 14, 2004. Reconsideration of that action is requested in view of the following remarks which incorporate matters discussed with Examiner Sirmons during the course of a person interview with Examiner Sirmons on January 25, 2005. The undersigned attorney wishes to thank Examiner Sirmons for the courtesies and helpful suggestions made during that interview.

Claims 27-28, 31-32 and 39 have been canceled without prejudice to advance the prosecution of this case. Claim 33 has been amended as well as dependent claim 36. Claim 33 is now the only independent claim. Claims 34-38 and 40-50 are dependent on claim 33.

Reconsideration is requested of the objection to the disclosure. In that objection Examiner Sirmons referred to the means plus function language in the claims as requiring explicit antecedent basis in the specification for the means plus function. The means plus function language, however, appeared solely in claims 27 and 28. Since those claims have now been canceled the objection should now be moot.

Reconsideration is requested of the objection to the specification with regard to providing the proper antecedent basis for the claimed "elastic modulus". That feature, however, appears solely in claim 39. Since claim 39 has been canceled the objection is now moot.

Reconsideration is requested to the objection to the drawings with regard to the "stepped half wavelength resonator". That feature was in claim 36. Claim 36, however,

has now been amended to delete the feature. Accordingly, since the feature itself is not being claimed there should be no need to illustrate the feature in the drawings.

Reconsideration is requested of the rejection of the claims under 35 USC 112. In that rejection specific mention was made as to claims 27-28, 36 and 39. Claims 27-28 and claim 39 have been canceled. Claim 36 has been amended to delete the questioned feature. Accordingly, the rejection under 35 USC 112 is now moot. It is noted that the amendment to claim 36 and the cancellation of claim 39 is made in order to advance the prosecution of this case. Accordingly, rather than amending the specification to provide the antecedent basis for the subject matter of those claims applicant will rely upon the fact that the claims were dependent on claim 33 and thus claim 33 by being a generic claim would inherently cover the features of claims 36 and 39.

It is respectfully submitted that parent claim 33 and its dependent claims are patentable over the prior art and in particular over Boukhny. The present invention as defined in claim 33 relates to an ultrasonic longitudinal-torsional tissue dissection system. This system includes three components. One of the components is a transducer. The second component is a resonator. The third component is the cutting tip. Significantly, the transducer produces only a single type of vibration which would be either a longitudinal vibration or a torsional vibration. That single type of vibration is transmitted to the resonator. At least a portion of the resonator has an inhomogeneous cross-section which converts the single type of vibration into a combined longitudinal-torsional vibration and the combined vibration would be transmitted to the tip.

A significant distinction of the claimed invention over Boukhny is in the use of a transducer which produces only a single type of vibration. In contrast Boukhny discloses a

hand piece wherein crystals 18 are provided to create a torsional vibration. Separate crystals 20 are provided to create longitudinal vibration. This combined vibration is then transmitted to the ultrasound horn 16 and eventually to the cutting tip 12. Thus, unlike the claimed invention Boukhny has two separate and distinct sources of vibration.

A further feature of Boukhny is that the tip is provided with a spiral thread 13 thereby resulting in the tip being “asymmetrically shaped”. Boukhny, however, is very clear as to the purpose of this shape. In that regard, Boukhny states at column 4, lines 7-14, that “The torsional motion of horn 16 may cause cutting tip 12 to loosen. In order to reduce the chances of cutting tip 12 becoming loose, tip 12 may be asymmetrically shaped, as seen in FIGS. 4 and 5. This asymmetric shape can be accomplished by cutting spiral thread 13 in tip 12 to increase the hydrodynamic forces on tip 12...” Thus, Boukhny is quite clear as to the purpose and function of the asymmetric shape of tip 12. Nowhere does Boukhny disclose that a resonator may be provided with an inhomogeneous cross section so as to convert a single type of vibration into a combined longitudinal-torsional vibration.

During the interview it was pointed out that applicant was attempting to define in claim 33 a system which clearly differed from Boukhny by having in that system only a single source of vibration in the form of a transducer that produced only one type of vibration. In order to make this feature clear claim 33 has been amended to delete the prior use of “comprising” and in its place claim 33 defines the system as “having only a single source of vibration consisting of only a single electro-mechanical transducer...” with “said transducer producing at said point of contact [with the resonator] only a single type of vibration selected from the group consisting of longitudinal vibration and torsional

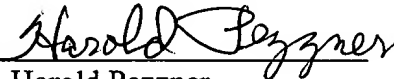
vibration". It is the intent of this language in claim 33 to differ from and exclude the type of system used in Boukhny where there are two separate sources of vibration. One of the sources produces longitudinal vibration and the other produces torsional vibration. Instead, with the system of claim 33 only a single type of vibration is produced which is then transmitted to the resonator and it is the inhomogeneous cross section portion of the resonator which produces the second type or combined vibration.

In view of the above amendments and remarks parent claim 33 should clearly differ from the Boukhny hand piece and claim 33 and its dependent claims should be allowed.

If Examiner Sirmons has any suggestions for placing this application in condition for allowance he is requested to telephone the undersigned attorney.

Respectfully submitted,

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